AVIATION

MARCH 6, 1922 Issued Weekly PRICE 15 CENTS

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VOLUME XII
Number 10

SPECIAL FEATURES

THE LIGHTER-THAN-AIR SITUATION

AERONAUTICAL CHAMBER OF COMMERCE ELECTION

AIRSHIP TRANSPORT COMPANY ORGANIZED

EUROPEAN AIR LINE REQUIREMENTS

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HIGHLAND, N. Y.
225 FOURTH AVENUE, NEW YORK

Entered as Second-Class Matter, Nov. 23, 1920, at the Post Office at Highland, N. Y.

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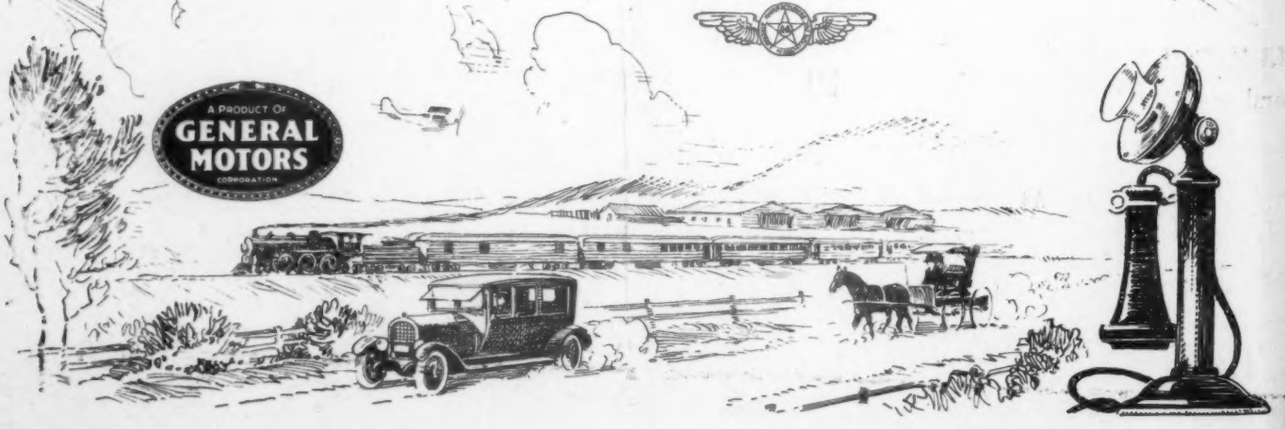

MARCH 6, 1922

AVIATION

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THOMAS-MORSE AIRCRAFT CORPORATION

Thomas-Morse Training 2-Seater in flight over Ithaca, N. Y.

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The photograph here shows a battery of the special glue presses for joining laminated wood parts. This careful lamination produces a unit infinitely stronger and more enduring than could possibly be shaped from a single piece of wood, while still preserving the important lightness and resiliency which are inherent to wood.

The process calls for the most careful work, the best of materials, and ideal conditions in respect to temperature and humidity of the glue room. Science and experience must be combined to secure an unfailing joint of maximum strength.

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AVIATION

LADISLAS D'ORCY, EDITOR
VIRGINIUS E. CLARK
EDWARD P. WARNER
RALPH H. UPSON, CONTRIBUTING EDITORS

Vol. XII MARCH 6, 1922 No. 10

Lessons from the Roma

AS usual in the case of a big wreck, there are probably several aspects to the case. We hope therefore that the committee investigating the loss of the Roma will go the full limit in ascertaining *all* the different ways in which the disaster could have been prevented. The best tribute to those who died will be to deal frankly and openly with all contributing causes, no matter who or what it may concern. We therefore respectfully suggest that attention be directed to the following questions:

1. Did the Liberty engines develop more thrust than the ship was originally designed for, and if so, how much more?
2. Were the steering surfaces designed to stand quick reversal at full power, or if not what precautions were customary in handling them?
3. Was there such a large purchase on the controls that the rudders and elevators could have been broken by forcibly turning them too far?
4. Was there any fouling of the tail, or other indications when the ship left the ground that the control surfaces were out of proper alignment?
5. Were all the engines signalled to stop as promptly as possible after the failure of the controls?
6. What objection can there be in a multiple engine ship to having a master switch in the hands of the chief pilot by which all engines can be instantly cut?
7. Was ballast released as promptly as possible after the failure of the controls?
8. Was there adequate provision for quickly releasing ballast and fuel?
9. Was it the hydrogen or the fuel which first caught fire, and in what manner?
10. Could more men have escaped if there had been better exit facilities from the car?
11. Was the ship flying at a safe altitude, considering its size and speed?
12. Were there competent authorities from the design staff of the Roma in consultation during the assembly and trials of the ship in this country?

Commercial Aviation in America

PERHAPS the most encouraging sign of the present year with regard to commercial aviation is the remarkable expansion in the activities of Aeromarine Airways in Florida. The list of passengers carried during the last few weeks by the flying boats of the "Black Tail Fleet"—as the company is called on account of its house mark—includes many names prominent in the world of finance, industry and society. This affords an interesting indication of the attitude the high-class traveling public is beginning to take in regard to public air transport.

The skepticism concerning the practicability of air travel, which was well nigh universal only a year or so ago, is gradually being displaced by a saner comprehension of the subject. Slowly, but surely, the idea is gaining ground that reliable aircraft operated by competent and conservative fliers afford a means of travel at least as safe as any other means of communication, while at the same time the amount of time saved, and the exhilaration felt, in air travel are beginning to be more fully appreciated.

This unmistakable change in the attitude of the public is entirely due to a continued practical demonstration of the safety of flying, for it could not come about in any other manner. In demonstrating this fact to the public, Aeromarine Airways has furnished far more than its share, if one considers the peculiar demonstration of "civil" flying contributed by "wing walkers" and other aerial acrobats.

If, as we hope, the House follows the action of the Senate, and endorses the Wadsworth-Hicks bill, there will become available a government agency for repressing the kind of flying which is distinctly harmful to the best interests of American civil aviation.

Guiding Airplanes through Fog

AN interesting device for guiding airplanes through fog and thick weather has recently been tried with success in France. This device, invented by M. Loth, briefly consists in establishing along an airway a ground wire through which an alternative high-frequency current is sent. The magnetic field created by this wire is detected on board the airplane by radio direction finders which indicate with remarkable precision the vertical and horizontal angles between the course of the airplane and the ground wire.

It will readily be seen that by means of this device a pilot flying in fog is enabled to determine not only whether he is drifting off his course, but also his vertical distance from the wire. Therefore, if such a wire is so established as to follow the elevations of the ground, flying in fog across mountainous country becomes practicable, for the radio detector will constantly show the pilot his height above the wire, and thus he will not have to fear colliding with a mountain top.

Most of the practical difficulties of this system appear to have been overcome, for it is officially announced that a section of the Paris-London airway is shortly to be equipped with the Loth "guide-cable" as the device is called. Not the least interesting point about this device is that it only requires a ground wire of small diameter, and that it can be mounted on existing telegraph poles. The expense involved is thus small in comparison with the services it is called upon to render. The practical demonstration of the Loth guide cable will therefore be watched with considerable interest.

The Lighter-than-Air Situation

Official Inquiry into the Roma Accident -- New Helium Appropriation Sought -- Fate of the U. S. Navy Zeppelin

The accidental loss of the Army airship Roma, recorded in our last issue, has in a way brought to a head the situation of the lighter-than-air establishment of the government. While the official inquiry is under way it does not seem proper to comment on this deplorable accident, save insofar as it may assist said inquiry. On the editorial page of this issue attention is directed to several factors which singly or in conjunction may have brought about the loss of this magnificent airship. In this connection the reader's attention is directed to the accompanying photograph which was taken shortly before the accident occurred, and which shows the control planes of the Roma at a considerable angle with the horizontal —that is, in an abnormal position.

The Casualty List

Following is the casualty list of the Roma, revised to the date when this issue went to press:

Dead.—Maj. John G. Thornell, Sidney, Iowa; Maj. Walter W. Vautsmeier, Freeport, Ill.; Capt. Dale Mabry, Tampa, Fla.; Capt. George D. Watts, Indianola, Miss.; Capt. Allen P. McFarland, Indianapolis, Ind.; Capt. Frederick J. Durrschmidt, Derby, Conn.; 1st Lieut. John R. Hall, Kingsville, Mo.; 1st Lieut. Wallace C. Burns, Brandon, Miss.; 1st Lieut. William E. Riley, New York City; 1st Lieut. Clifford E. Smythe, Chicago, Ill.; 1st Lieut. Wallace C. Cummings, Springfield, Tenn.; 1st Lieut. Ambrose V. Clinton, Savannah, Ga.; 1st Lieut. Harold K. Hine, Bridgeport, Conn.; Master Sergt. Roger C. McNally, Philadelphia, Pa.; Master Sergt. James Murray, New York; Master Sergt. Homer Gorby, Raymond City, W. Va.; Technical Sergt. Lee M. Harris, Langley Field, Va.; Staff Sergt. Louis Hilliard, Cold Water, Kans.; Staff Sergt. Marion J. Beall, La Plata, Mo.; Sergt. Thomas A. Yarborough, Selma, Ala.; Sergt. William J. Ryan, Brooklyn, N. Y.; Staff Sergt. Edward M. Schumaker, Red Bank, N. J.; Staff Sergt. James M. Holmes, Ashland, Ky.; Corp. Irvey B. Hevron, Elwood, Ind.; Private John E. Thompson, Bentonsville, N. C.; Private 1st Cl. Marion Hill, Newton, Ill.; Private Gus Kinkston, Louisville, Ky.; Private Theron M. Blakley, San Francisco, Calif.; Sergt. Virgil C. Huffman, Eaton Rapids, Mich; Walter W. Stryker, McCook Field, Dayton, Ohio; Robert J. Hanson, McCook Field, Dayton, Ohio; Wm. O'Laughlin, McCook Field, Dayton, Ohio; Charles N. Shulenberg, McCook Field, Dayton, Ohio; T. H. Harriman, McCook Field, Dayton, Ohio.

Injured.—Maj. John D. Reardon, Washington, D. C. (Possible fracture of skull; expected to recover.); Capt. Walter J. Reed, Searsdale, N. Y.; 1st Lieut. Clarence H. Welch, Papillion, Neb. (Minor injuries); 1st Lieut. Byron T. Burt, New York City. (Minor injuries.); Master Sergt. Harry A. Chapman, St. Joseph, Mo. (Badly burnt; expected to recover.); Corp. Albert O. Flores, Norfolk, Va.; Sergt. Joseph M. Biedenbach, Akron, Ohio. (Minor injuries.); Charles W. Dworack, McCook Field, Dayton, Ohio (Badly burnt; expected to recover.); Walter A. McNair, Bureau of Standards, Washington, D. C. (Minor injuries.); Ray Hurley, McCook Field, Dayton, Ohio. (Minor injuries.)

Uninjured.—Private Virden T. Peck, Terre Haute, Ind.

A Letter

The following letter is of considerable interest in that it expresses the views of an eyewitness regarding the behavior of the Roma and her crew on a trip previous to that which ended so tragically.

FEBRUARY 23, 1922

MAJOR GEN. MASON T. PATRICK,
Chief, Army Air Service.

SIR:

Through your courtesy the writer made the return trip to Langley Field on the Roma following the christening ceremonies on Dec. 22. In view of the publication today of a letter credited to the late Lt. Clifford Smythe, one of the victims of Tuesday's disaster, in which the statement is alleged to have been made that, inferentially at least, places you in the bad light of ordering an unsafe ship to make the return flight, I think it only just to you and to the commanding officer of the Roma that you be informed, for such use as you see fit, of what I learned about the condition of the ship on her arrival and from personal observation on the return trip.

During the christening ceremonies, I held a long conversation with Major Thornell and another with Captain Mabry, both of whom I knew personally, with special reference to the maneuvering ability of the Roma and the proficiency of the unusual elevating plane and rudder, under the handicap of a strong head wind and the loss of nearly 50 per cent of motive power on the trip to Washington, and in comparison with the conventional form of elevator and rudder.

Both were enthusiastic over the way the ship answered the controls and insisted that the only real trouble experienced was the freezing of two engines, stopping them, and the development of mechanical trouble in another which prevented its giving maximum horsepower. Neither of these officers gave the slightest intimation that the controls had given the least bit of trouble or had not worked perfectly. Their discussion of the trip gave the exact opposite impression.

On the return trip Captain Mabry took pains to show me the ease and certainty with which the Roma answered her controls. An unusual opportunity to demonstrate this was given in the attempt to land at Langley Field, which had to be made through a cross wind—the wind blowing was from one direction at the ship's altitude, the same on the ground but eddied in between.

The ship arrived after dark. Landing searchlights were placed in accordance with ground wind direction and the direction indicated by the vane on top of the hanger. Nosing down in accordance with the landing directions, the ship was caught in the eddy and headed directly into the side of the hangar. Captain Mabry, at the control, apparently realized instantly what was happening. He ordered all engines to full speed, rapidly spun the elevator control wheel and directed the throwing out of a certain amount of ballast. The Roma responded beautifully and instantaneously and literally swooped up out of danger.

The same thing occurred three times. Each time the Roma was compelled to either answer the elevator and rudder almost instantly to avoid disaster. On the fourth venture Major Thornell and Captain Mabry had worked out the cross current and brought the ship to earth with the same exactness as prevailed on landing her at Bolling Field. Had there been any great sluggishness, such as is said to have been described by Lieutenant Smythe, or had she disobeyed or refused to obey her rudder control in any material degree, the first real test flight of the Roma would have ended disastrously on Dec. 22.

In writing the story of the flight on the Roma I stated that with a crew one whit less heroic or pilots one whit less skillful the Roma would hardly have reached Washington and most certainly would not have been landed back at Langley Field without mishap.

Major Thornell, Captain Mabry, nor yourself deserve the stigma implied in the letter made public in Chicago of having sent into the air an unsafe and dangerous ship.

I should add to the above that I talked to a number of the enlisted personnel on board and they were as enthusiastic as the officers over the conduct of the ship other than the natural disappointment over the loss of motive power. I should also point out that on the return trip, or over a major portion of it, only two of the six engines of the Roma were working properly. The maneuvering at Langley Field under the dangerous

conditions mentioned above was performed with only two engines and that, in my opinion, further refutes the charge that the elevator and rudder were not working properly.

Respectfully,

(Sgd.) THOMAS R. DARDEN
Staff Correspondent, *New York World.*

New Appropriation for Helium Development Sought

The question of whether or not the Government should undertake the production of helium for airship inflation was discussed informally at a Cabinet meeting held at the White House on Feb. 24.

During the discussion regarding the loss of the Army airship Roma, Secretary Fall of the Interior Department is said to have announced that the War and Navy Department would shortly ask Congress for an appropriation of approximately $5,000,000 for the extraction of helium from the natural gas pools in this country for use in airships. It is believed by nearly all Government experts, that helium, if it did not entirely solve the problem of safety in airships, it would at least eliminate one great fire hazard.

In addition to the well-known sources in Texas, Secretary Fall showed the Cabinet members a map on which were designated gas fields in Pennsylvania, Ohio, Kansas, Oklahoma and Indiana where helium-bearing natural gas was available. Speaking of the work already done by the Government in an experimental way for the Army and Navy, Secretary Fall mentioned the plants at Fort Worth and Petrolia, Tex., which were practically closed recently because of lack of Congressional appropriations. At present, the Secretary announced, the total helium production in this country amounted to about 2,400,000 cu. ft. of helium, extracted at a cost of about 13 cents per cubic foot. This is the first official intimation of the total amount of helium produced to date, which so far was understood to be only 1,000,000 cu. ft. The Government, Secretary Fall said, hoped to produce helium in quantities so that it would be available for commercial lighter-than-air ships as well as for those of the Army and Navy.

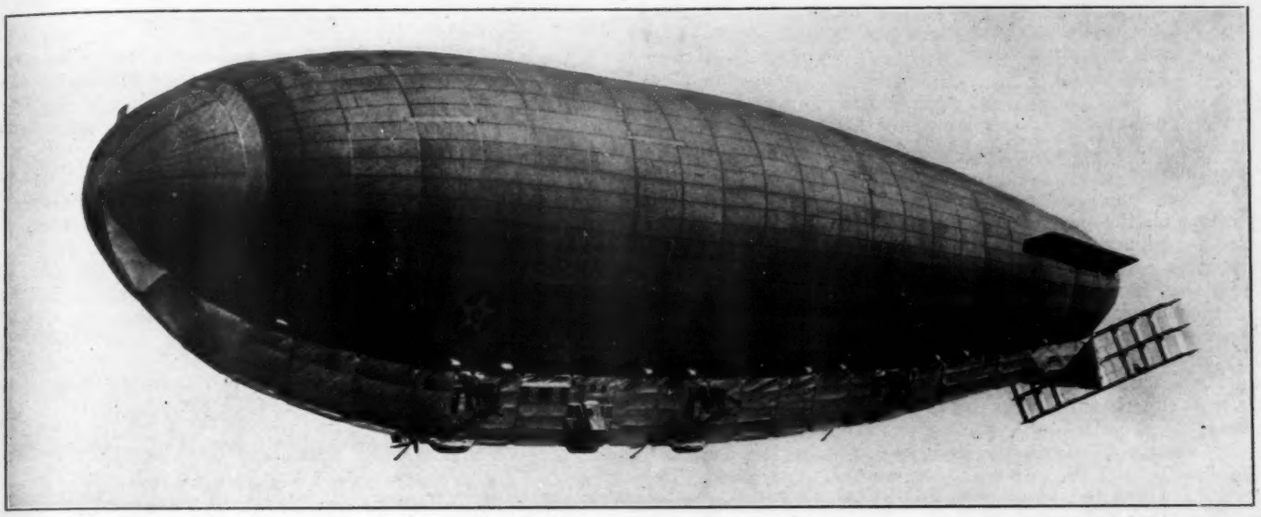
The erection of new plants at other favorable places was also mentioned by Secretary Fall. Recently it was announced at the Bureau of Mines that the Government knew of one or two gas fields in the United States which alone could supply enough helium for the operation of a conservative lighter-than-air program for the next twenty years, and that this country owned the only sources of helium in commercial quantities in the world.

Present Helium Production Capacity

The present Government helium plant, Dr. Richard B. Moore said in a recent interview, is producing from 10,000 to 12,000 cu. ft. of 95 per cent purity per day. Operating at full capacity, he said, the plant should be able to produce 35,000 to 40,000 cu. ft. per day, but that lack of appropriation had practically caused the closing of the plant. He said, also, that nearly 500,000,000 cu. ft. of helium gas is going to waste annually.

The practical use of the inert helium gas in aircraft was recently demonstrated by Admiral Moffett, chief of the Naval Bureau of Aeronautics, who had the naval airship C7 filled with this gas as an experiment. Great success attended the tests, both as to the lift and ease of operation of the craft. The gas so used was recovered from the bag, and turned over to the Army for analysis and purification with a view to its further use in aircraft.

Air Officers point out that the accidents to the Naval airship R38 and the Roma were dissimilar, the former resulting from too great a strain on her frame work during a turning movement at high speed, while the latter accident apparently resulted from loss of control and contact with a high voltage electric wire. The point of similarity, however, is that had these ships been filled with helium there could have been no fire from the escaping gas, although a fire may have been started by the large amount of gasoline aboard.



Wide World Photos

How the Roma appeared shortly before the accident: Note the angle of the elevator-rudder cell with the horizontal tail plane. The rear engine alone is stopped

Features of the Roma

Unlike the ZR2, which was a rigid ship, the Roma was not stiffened within her envelope by a frame work. Her gas containing envelope was rigged inside the outer cover, and was divided by means of diaphragms into eleven gas cells. Her V-shaped keel, which was her only rigid part, was hollow and contained a long corridor with a large operating room about amidships for the two pilots, and the nicely appointed passenger cabin, together with space for supplies and the crew. Along the sides of the keel were port holes and windows and doors for entrance and exit. Set out from the keel rigidly attached, were six engine platforms on which originally were installed the Ansaldo engines, recently replaced with Liberty's.

Major Thornell, Captain Mabry and Lieutenant Reed were detailed by the Army to go to Italy, study the ship and supervise her packing when the Government decided to purchase the craft in 1920. When the ship reached Langley Field, they supervised her erection and took her on her first American trip in November, 1921. On that cruise the vessel experienced her first accident; one of the propellers threw off a splinter which cut the outer envelope and punctured one of the gas cells. Only the presence of mind of several of the mechanics saved the ship from destruction at that time. Sergt. Lee M. Harris realizing the danger of the hydrogen becoming ignited by the sparks and exhaust from his engine, immediately shut his engine off, and with Sergt. Wm. Fitch and C. E. Brannigan

relieved the pressure of that compartment. Afterward the three men repaired the punctures although they all became unconscious from the gas during the undertaking. With only her midship and after engines the vessel was navigated to her station and landed safely.

On her trip to Washington for her christening, last December, four of her six Ansaldo engines "froze," but the ship gave a good account of herself in fighting the heavy gale which she bucked up to Langley Field. Following this experience Army air engineers decided to equip her with six Liberty engines.

The christening was a gala day for old time aviators and even those who had only just won their wings, for it meant a day of progress in aeronautics toward which they had all looked forward; America had the largest semirigid airship and the Air Service was proud of her. Now she has gone, save for the broken and smoke stained keel, as the envelope was entirely consumed when the hydrogen gas caught fire.

Statement by C. of A. S.

The Chief of Air Service issued the following official statement in connection with certain irresponsible reports on the accident:—

"Despite published reports to the contrary there is no disposition on the part of anyone in the Army Air Service to place the blame for the Roma accident at the doors of Congress.

"Statements that failure of Congress to appropriate funds for helium production and that the lack of helium caused the accident are not based on fact. Congress appropriated liberally for the development of the processes foi extracting helium during the war, and has since given all funds requested for further experimental work looking to perfecting these processes.

"The Roma disaster would have happened just the same had the ship been filled with helium instead of hydrogen. It is true, however, that in all probability, the loss of life might not have been so great.

"A rigid investigation is now under way to determine the exact cause of the accident. As soon as the Board completes its work, public announcement will be made of its findings."

(Signed) MASON M. PATRICK,
Major General, A.S.
Chief of Air Service.

Regarding the U. S. Navy Zeppelin

The Secretary of the Navy has been quoted as saying in effect that the Navy Department had advised the State Department to refuse to accept a German Zeppelin unless the ship could be obtained entirely free of cost. This partial quotation is somewhat misleading and the situation with regard to obtaining for the United States a German Zeppelin airship is according to a statement issued by the Navy Department substantially as follows:—

"At the time of the Armistice there were existing in Germany thirteen rigid airships which were to be delivered by the Germans to the Allied and Associated Powers. Six of these airships were delivered to certain of the Allied Powers, but before the remaining seven could be turned over they were illegally destroyed by the Germans. The German government has been required to replace these seven airships in kind or by a cash payment. The United States being entitled to share in the distribution of the original thirteen airships was entitled to two ships, but not having received her allocation before the destruction of the seven, technically the United States is still entitled to two airships applying against the seven which must be replaced by Germany.

"The United States having pressed its rights in the matter to be allocated airship tonnage on the same basis as any other of the Allied or Associated Powers, obtained the consent of the Council of Ambassadors to have built by Germany for the United States a single airship of not greater than 70,000 cu. m. (about 2,500,000 cu. ft.) displacement and designed for civil purposes. It now appears that the valuation placed on the seven destroyed Zeppelins by a technical commission operating under authority of the Treaty of Versailles, which the United States was not a party to, was placed at so low a figure that a credit which the United States was assigned by the Allies on the reparations account to cover two destroyed ships is insufficient to cover what the Germans claim to be the cost of building one ship of a modern design under present conditions in Germany.

"The Navy Department has taken the position that no payment of money will be made to Germany for the one airship, and that the extremely low valuation placed upon destroyed ships by the Allies in 1919, and the high estimate now given by the German government for a single replacement ship in 1922, must be reconciled. The State Department is now conducting negotiations with all parties interested in order to make it possible for the German government to proceed with the construction of an airship in accordance with the specifications of the Navy Department which is representing the Army and the Navy in this matter."

It is reported in the Army Air Service that if the Navy did not want the German Zeppelin which is to be constructed abroad, the Army Air Service would, and could, take it over under the old agreement which provided that the Army Air Service could operate rigid airships although their development had been assigned to the Navy Bureau of Aeronautics.

Plans for the continued construction of the ZR1 now being fabricated at the Philadelphia Aircraft Factory will be carried out, it was said by Secretary Denby and Admiral Moffett. Three Naval Aviation officers left New York on Feb. 24 for Germany to supervise the work. Lt. Cdr. Zachary Lansdowne, and Lieutenants Fulton and Pennoyer, have been detailed to supervise the Zeppelin construction and will sail at once.

Notice to Aviators

Issued by Hydrographic Office, U. S. Navy

Flying route from Mineola to Washington and the South.—The following suggestion concerning a flying route through New Jersey for planes bound from Mineola to Washington and the South has been received from Mr. G. S. Ireland, president of the Curtiss Eastern Airplane Corp.:

"We believe that what is known as the 'Jersey Road,' from Mineola to Philadelphia, Washington, and the South, is far better than the old route followed by the mail pilots and Army fliers, who pick up the Pennsylvania Railroad at Jersey City, cross the Delaware into Pennsylvania at Trenton, and follow the Delaware River to Philadelphia.

"Planes going by the 'Jersey Road' leave Mineola steering a southwest course, pass halfway between the town of Freehold, N. J., and the old Pennsylvania Railroad tracks coming to Bordentown, pass Camp Dix on the left and Mount Holly, N. J., on the right, flying straight over Medford, until they pick up the first railroad, which is the Pennsylvania line between Camden and Atlantic City. Before reaching the Reading Railroad to Atlantic City the Curtiss Flying Field will be seen. This can be recognized by the two white hangars with green roofs with the word CURTISS in large letters on the roof. This field is a four-way field and consists of 100 acres adjacent to other fields which can be used for emergency landings. Continuing the route to Washington, head straight for Glassboro, which is the next railroad crossing, then for the Delaware River, crossing the river below Salem, and pick up the canal which enters Chesapeake Bay, from which point follow the old route to Baltimore and Washington.

"The advantages of this route, we find, are due to the fields which have supplies and give service, such as the Aeromarine Field at Keyport, Camp Dix, and our field at Pine Valley. It is also shorter, and its great advantage is the fact that you can always find an emergency field to land anywhere between Mineola and Pine Valley in case of a forced landing. The Curtiss Field at Pine Valley is the nearest large field to Philadelphia and has telephone, train, trolley, and good road facilities to Philadelphia. It is a four-way field and is not surrounded by any obstacles which can not be seen from the air, such as transmission wires and fences. Such machines as the Curtiss Eagle, the Junkers and the Fokker use our field when wishing to reach Philadelphia."

—*(N.A. 12, 1921.)*

Aeronautical Chamber of Commerce Election

Body Representing Manufacturing, Engineering, Operating And Accessory Interests Elects its Board of Governors

A meeting of the members of the Aeronautical Chamber of Commerce of America was held at the offices of the Chamber, 501 Fifth Avenue, on the afternoon of Feb. 24, 1922, for the purpose of choosing a permanent Board of Governors, representative of all of the varied aeronautical interests included in the organization, and perfecting the organization upon a permanent basis, commensurate with the size and scope of its entire membership and responsibilities.

The Aeronautical Chamber of Commerce, which includes in its membership practically all aviation interests—manufacturing, engineering, operating and accessory—in the United States, is the culmination of the movement started nearly three years ago to coordinate the aeronautical trade into a well-balanced, truly representative trade body. Its efforts will be directed toward popularizing travel by air and the use of aircraft among civilians.

The New Board of Governors

Samuel S. Bradley presided at the organization meeting as temporary President. Eleven Governors were chosen, representing all classes of membership as follows:—

C. C. Witmer, President, Airship Manufacturing Co.
Frank H. Russell, Vice-President, Curtiss Aeroplane and Motor Corp.
John M. Larsen, President, J. L. Aircraft Corp.
Grover C. Loening, President, Loening Aeronautical Engineering Corp.
Samuel S. Bradley, General Manager, Manufacturers Aircraft Association
F. B. Rentschler, President, Wright Aeronautical Corp.
B. E. Bushnell, Director of Sales, Stewart Hartshorn Co.
Charles H. Colvin, General Manager, Pioneer Instrument Co.
Sherman M. Fairchild, President, Fairchild Aerial Camera Corp.
Lawrence Sperry, President, Lawrence Sperry Aircraft Corp.
Charles F. Redden, President, Aeromarine Sales and Engineering Co. and Aeromarine Airways, Inc.

The various organizations represented by the Board of Governors indicate the wide scope of the Aeronautical Chamber of Commerce including as it does, manufacturers, engineers and operators of both heavier- and lighter-than-air craft, as well as manufacturers of accessories and supplies.

Report of the Temporary President

The temporary President, in his report to the meeting, said in part as follows:—

"I think a word of congratulation and appreciation should be expressed as to the very splendid way in which this new organization has been received by the Industry and profession. We have to date 147 applications for membership in the various classes. Since no organized effort was made to solicit members until about the end of last year, I am sure you must recognize that this result is very satisfactory and encouraging.

"For the information of those who have recently joined the organization, it may be well, as briefly as possible, to give at this time, a short resumé of the beginning of the movement that has finally developed into the organization of the Aeronautical Chamber of Commerce of America, Inc.

"A little over three years ago some of us who had been in contact with the general aeronautical situation, realized, that before the industry could be properly developed and become a well-balanced, positive factor, it would be necessary to provide a properly constituted central trade body. Shortly after that time, the Manufacturers Aircraft Association, representing a substantial number of manufactures of planes, and motors, in order to encourage the development of a group or common trade interest, developed a comprehensive organization for the collection and dissemination of reliable information relative to the industry, and established an adequate, well-indexed and up-to-date aeronautical library. But those of us having direct charge of this work appreciated, that in order to make it wholly effective and to proceed along the line of least resistance, it would be desirable, if not necessary, ultimately to increase the scope of the organization, by widening its membership. This seemed desirable not only for the purpose of securing increased revenue, but also for the purpose of obtaining a wider diffusion of interest through increased numbers and a greater spread of membership, geographically.

"As a result of this conviction a general discussion of the question was held among various representative elements in the industry to pave the way for a realization of a plan to meet this situation, articles of incorporation were secured in the fall of 1919. At that time, however, and continuing for the next two years, the unsettled state of the industry, following the cancellation of war contracts and a reorganization of the entire business upon a peace basis, made it impracticable to arouse any real interest in the plan. It was therefore deemed advisable not to attempt to complete the new organization, but to carry on the work that had already been started, holding the situation intact until the industry had an opportunity to readjust itself to new conditions. Last fall it seemed that the time had arrived when the subject should be revived. This was somewhat quickened by the fact that it was necessary, in compliance with the law, that the incorporation be formally completed and functioning before Oct. 1, in order to preserve our charter.

"Organization Fills Genuine Need"

"Therefore, the original incorporators held meetings; formed a temporary organization and authorized the presentation of the plan to the industry at large. As you know, pursuant to the above, the plan was submitted to about 100 individuals, corporations and firms prominently identified with the industry, soliciting applications for founder or charter memberships. All of these were tentative in form and were not to become effective until at least thirty applications were received. This gives a clear indication of our modest hopes and expectations. As has already been stated, this presentation of the plan to the industry was not thoroughly organized and under way until December of last year. We have, therefore, not only great satisfaction, but real assurance, in accomplishing in two months and a half the results already obtained. The fact that in so short a period applications received represent every kind of interest and from the Atlantic to the Pacific, is not only proof that this organization fills a genuine need, but that its plan and scope meet this need as well as the approval and endorsement of the industry as a whole.

"These results in all probability could not have been obtained in so short a time except for the fact that, through efforts of the past, we have had the advantage of visualizing results that may be accomplished in this field. The prestige and experience of the Manufacturers Aircraft Association in its general activities provided the foundation upon which to build.

"Our membership, as you know, comes within three general classifications: (1) Those who manufacture complete units, parts or accessories thereof, or materials or supplies; (2) Those who are engaged in designing or engineering; (3) Those who are engaged in selling, distributing or operating aircraft or who own machines.

"The desire of the engineer is to improve aircraft in safety and efficiency. The desire of the manufacturer is to produce and sell such improved aircraft in increased volume. The desire of the distributor, operator and owner is to demonstrate the profitable and reliable operation of aircraft.

Proposed Plan of Action

"The Aeronautical Chamber of Commerce proposes to aid in the fulfillment of the common desire of all of our members by *selling aviation* not only to the American public but to foreign markets, wherever they may be. It proposes to act in three general channels as follows:—

1. Cooperation with the various departments and bureaus of the Government at Washington, having to do with aviation at home and abroad.
2. The promotion of flying meets, demonstrations and aeronautical shows.
3. The holding at intervals, of at least once a year, an Aeronautical Institute, possibly in conjunction with an aeronautical show or flying meet, to be conducted by and for engineers and designers, for the purpose of exchanging thought on scientific development in the art and making such development available for public education.

"Indispensable to the successful promotion and prosecution of the above general activities is publicity, including the Aircraft Year Book. Publicity provides inspiration for effort and capitalizes the results of endeavor. It excites inquiry and satisfies curiosity. It is a distinct and vital function, yet is an integral part of all functions. Upon the constructive and persistent education of the public, through publicity, depends the successful development of our aviation market. It is appalling the tremendous ignorance and misinformation still found, even among educated and generally informed men and women, on this subject. As will later be shown, the publicity that has been given aeronautics is beyond our most sanguine hope, but in spite of all that has been printed, done and said, the fact still remains that we have simply scratched the surface. Experience has shown that the press of the country is behind this movement, but it demands continually intelligent guidance.

Recommendations

"As a recommendation for continuing the work during the balance of this year, I submit the following:

1. Continued cooperation with the various departments and bureaus of the Government at Washington, having to do with aviation at home and abroad.
2. Steps should be taken at once for the planning and management of a few flying meets, so conducted that they will actually contribute to the maintenance of our organization.
3. Arrangements should be made for holding an aeronautical institute.
4. A plan for the publication and distribution of the 1922 Aircraft Year Book should be perfected.
5. A drive for new members should be maintained and actively participated in by each member.

"In reference to the latter recommendation, I think a special word should be added. We recognize that we have met with splendid success in securing members, but with very few exceptions, all of the present membership has been developed by the work of this office. Very little has been contributed though the cooperation of our members. Before the organization is upon a satisfactory basis we must have twice as many members as we now have in each class or its equivalent. The recruiting of new members from now on can be done much more effectively by our members at large than through this office. In your daily contact you will recognize individuals and firms who should support our organization. If you will send in their applications, you will help and lighten the work tremendously. Every individual, firm or corporation who hopes to make money through the development of aeronautics should be a member."

A meeting of the Board of Governors will be held early in March for the purpose of electing permanent officers, appointing committees and arranging other details.

Italy's Air Policy

A policy of strict economy in army expenditures is to be inaugurated by the new Italian Minister of War, the Honorable Gasparotto, who has been in office about five months. Both Military and Civil Aeronautics in Italy are under the Minister of War, and he recently made the following statement of his intentions concerning the Air Service:

"It is my intention to cut down all branches of the Army including the Air Service. The Military Air Service will be kept within the limits strictly essential for proper war preparation. The development of civil aviation must be undertaken on a large scale. In this manner the appropriations for aeronautics will not be wasted in industrial ventures of which the State is always a most unfortunate administrator. The appropriations are to be spent wisely; for specific experiments, for the purchase of new material, for the preparation of the personnel, and for equipping the various branches of the Air Service. As far as possible recourse will be had to private enterprises, stimulated by free competition, rather than to Government establishments which are a burden to the State and are apparently kept up to maintain the employees in service. The plan for reforming and reorganizing the Air Service has been drawn up by the Advisory Committee for Aeronautics, but the Army Air Service must be duly considered and any reorganization must go hand in hand with the Army organization.

"Civil Aviation will receive the greatest possible support from the Government, but always with the idea of developing and in full cooperation with the Military Air Service. Thus, with a minor expenditure of money there will be created not only a strong Air Service for Italy's possible future defense, but also a source of industrial wealth and a large exportation."

Prior to his appointment, the new Minister of War was a member of a group of fifty representatives in the Italian House of Representatives known as the "Aeronautical Group". This group is made up of representatives from various political parties, organized and pledged to support and assist in all legislative matters for the organization and development of Commercial Aeronautics. Up to the present time this group has not succeeded in getting any of its proposed legislation through the House. A similar organization has just been organized in the Senate along the same lines and for the same purposes. It consists of from 40 to 45 members at present, including many of the most prominent Senators, in addition to those who are most prominent in industry and science.

Ballast and Loose Articles in Aircraft

The Air Board of Canada notifies under Jan. 20, 1922:

Attention is drawn to the necessity of ensuring that ballast, personal luggage and other loose articles carried in aircraft in such a position that movement might cause them to fall out during flight, or to interfere with or foul the controls should be properly secured before flight commences.

Cushions in the pilot's, mechanic's or passengers' seats should be so fixed that they cannot fall out or slip forward. It is recommended that, in cases where the standard cushion is not suitable for an individual pilot, a special cushion should be provided in preference to using several cushions that cannot readily be secured to the seat.

Passengers should be warned that it is exceedingly dangerous to drop any article from an aircraft in flight and that any person contravening the Air Regulations, 1920, in this respect is liable to six months imprisonment or a fine of $1000 or to both such imprisonment and fine.

Recruiting Reserves on Mexican Border

Assignment of available reserve Air Service officers has been made in the 90th Division (Organized Reserves) El Paso, Tex. Reserve pilots in this vicinity are preparing to stimulate interest in aviation by recruiting former Air Service mechanics as a nucleus for a live organization to be kept ready for action.

General Air Service Co. Organized

Plans to Operate German Built Schuette-Lanz Airships On Public Transport Services in this Country and Abroad

Another project for establishing transportation by airships has been announced. It is planned to build the airships in Germany, assemble them in the United States, and operate air transportation routes between American cities. Later, it is proposed to link this continent with the rest of the world by aerial service. The company has been incorporated under the name, General Air Service.

For two years the plans of the company have been known. Fred Hardesty, who represents several large corporations in Washington, originated the idea of a large international airship operating company. He was at that time the representative in this country of Dr. Johann Schuttee, a well known designer and builder of airships in Germany. Mr. Hardesty saw the great advantage to the United States in having a commercial development of airships as a means of national defense. He interested a number of well known financiers in his plans and organized the American Investigation Corp. to make an engineering study of lighter-than-air possibilities. Snowden A. Fahnestock of the banking house of Bertron, Griscom & Co. is president of this investigating company and the following well known men are given as subscribers.

The Subscribers

Allderdice, Taylor, V. P. National Tube Co., Pittsburgh;
Bai L'hme, C., Pres., Mattheissen Hegeler Zinc Co., Chicago;
Benet, L. V., Pres., Hotchkiss Co. Paris, New York;
Bertron, S. R., Pres., Bertron, Griscom & Co., New York;
Black, John D., Attorney, Chicago;
Boeing, W. E., Pres., Boeing Airplane Co., Seattle;
Bolton, Chester C., Capitalist, Cleveland;
Brooks, Chas. F., Lawyer, Cleveland;
Chandler, D. DeF., Lieut. Col., U. S. Army, Retired, Washington;
Clark, Edward H., Pres., Homestake Mining Co., New York;
Crowell, Benedict, Crowell & Little Construction Co., Cleveland;
Culver, C. C., Lt. Col. U. S. Army, Washington;
Davis, Arthur V., Pres., Aluminum Co. of America, Pittsburgh;
Dunham, L. L., Capitalist, New York;
Fahnestock, Snowden A., Bertron, Griscom & Co., New York;
Field, Marshall, Capitalist, Chicago;
Goodrich, David, Goodrich, Lockhart Co., New York;
Hanna, L. C., Jr., Capitalist, Pittsburgh;
Hardesty, Fred S., Consulting Engineer, Washington;
Herr, E. M., Pres., Westinghouse Elec. & Mfg. Co., Pittsburgh;
Hilliard, W. H., Capitalist, Pittsburgh;
Homer, Francis T., Bertron, Griscom & Co., New York;
Johnson, Crawford, Director, 1st National Bank, Birmingham, Ala.;
Joyce, W. B., Pres., National Surety Co., New York;
Kenley, W. L., Marland Oil Co., Oklahoma;
Kirby, John H., Capitalist, Houston, Tex.;
Lockhart, James H., Capitalist, Pittsburgh;
Lovejoy, J. R., Vice Pres., General Elec. Co., New York;
McCune, John R., Pres., Union National Bank, Pittsburgh;
McDonald, John R., Pres., First National Bank, Erie, Pa.;
McEldowney, H. C., Chairman, Union Trust Co., Pittsburgh;
McRoberts, Samuel, Capitalist, New York;
Marland, E. W., Capitalist, Kansas City;
Mellon, R. B., Capitalist, Pittsburgh;
Mellon, W. L., Pres., Gulf Oil Co., Pittsburgh;
Mudge, E. W., Steel Operator, Pittsburgh;
Penton, John, Penton Publishing Co., Cleveland;
Pratt, Theodore, Standard Oil Co., New York;
Remington, Franklin, Pres., Foundations Corp., New York;
Richardson, W. E., Attorney, Washington;
Roosevelt, Franklin D. V., Pres., Fidelity & Deposit Co., New York;
Schildhauer, Edward, Consulting Engineer, Washington;
Shaw, Wilson A., Pres., Bank of Pittsburgh, Pittsburgh;
Squire, Andrew, Lawyer, Cleveland;
Stevenson, Lewis G., Agriculturist, Blommington, Ill.;
Thaw, Benj., Capitalist, Pittsburgh;
Wilson, Thornton, R. T. Wilson & Co. (Bankers), New York;
Winston, Hamden, Real Estate, Chicago;
Wrigley, Philip N., Wm. Wrigley Co., Chicago;
Young, Owan D., Vice-Pres., General Elec. Co., New York.

An investigating committee headed by Benedict Crowell, former Assistant Secretary of War and President of the Aero Club of America, visited Europe and studied the airship development in England, France, Germany and Italy. In these investigations the committee had the cooperation of Dr. Schuette of the Schuette-Lanz Airship Co. of Germany and a corps of his engineers. The committee also visited the Zeppelin factories. They made flights in British, ex-German and Italian airships and secured data covering manufacturing and operating costs, not only of airships but of hangars, mooring masts, landing fields and terminal facilities. They secured information and engineering data respecting flights over routes in the countries named, passenger accommodations, etc.

Statement by Mr. Crowell

Mr. Crowell has issued a statement regarding the purpose of the company, which says in part:

"Our aim is to provide rigid airship service to America first, and, as time goes on, link this continent with the rest of the world by aerial routes, a service supplementing existing methods of transportation, one which will traverse space in a minimum of time and supply a means of travel both safe and comfortable.

"In this country we looked into the helium question, its cost and probable supply; sources of operating revenue, passenger, freight, express and mail; the most feasible routes over which to start our new service to supplement existing traffic facilities; meteorological data and the effect that our climate will have on a yearly operation schedule; and the thousand and one things which develop into real problems to be surmounted in any undertaking of such wide application.

"We uncovered enough evidence early on our trip to Europe taken with that previously found to convince use all that the time had arrived for action; that certain conditions abroad, if taken advantage of, would place the United States in the lead in the airship industry, perhaps for all time. Political conditions, reduced rates of exchange, post-war reparations, the nonemployment of airship talent, all these were factors in giving airships a setback in Europe. These factors are to our advantage.

"The unit of life today is *time* not *distance*. Therefore the vehicle employed in reducing the time required to cover a given distance is of immense importance to the business world. That is where the airship comes in. It is essentially a long-distance craft. The running time of General Air Service liners will be ten hours from New York to Chicago and only forty hours from New York to the Pacific coast. Think what this means to business dealing in express shipments where time is a factor."

Mr. Crowell points out that the General Air Service ships would be available for training airship personnel in peace time and immediately serviceable as auxiliary ships in time of war.

Dr. Schuette is again in this country. This second visit has made possible the incorporation of General Air Service and made more definite its plans. The first line the company hopes to put into operation will be from New York to Chicago, to be extended to Pacific coast cities as soon as additional ships can be built. It is planned to operate the New York-Chicago lines by two ships, each of approximately 4,000,000 cu. ft. capacity, these ships to be fabricated in Germany and erected in the United States. They will be designed to provide adequate accommodations for 100 passengers and 30 tons of mail and express matter. It is planned also to build larger ships for lines to South America and Europe when the facilities for complete construction have been gathered in America.

At the New York office of the company, it was stated that the company was not capitalized at $50,000,000 as has been erroneously reported in newspapers.

It is hoped that the ships which are to be fabricated in Germany can be assembled at the Lakehurst, Cape May or Scott Field government airship stations. The use of helium is contemplated as well as other new airship improvements which will make the ships of the company as safe as the best engineering practice can provide. It is proposed to have the ships designed and fabricated by Dr. Schuette whose long experience in the construction of airships has made his reputation international. The company hopes to have its ships in operation within a year. The names of the officers have not been announced.

U. S. Chamber of Commerce on Air Legislation

"The Success of Air Transport is Bound up with, and Vitally Depends, on the Promulgation of an Efficient Air Code"

At the ninth annual meeting (1921) of the Chamber of Commerce of the United States, the subject of aeronautic legislation was introduced by resolution of one of its constituent members, the National Aircraft Underwriters Association.

After being duly referred by the Board of Directors of the Chamber to the Department of Transportation and Communication, the matter received definite consideration by the Department and by the members of its Advisory Committee, composed of executives, engineers and manufacturers, each particularly experienced in one or more important phases of transportation and communication. As a result of its consideration, the Department Committee voices the following expressions in regard to the present aeronautic situation and the urgent need for action.

Recommendations

The Department Committee recommends in principle.

1. The immediate support of basic national legislation on aeronautics providing for appropriate regulatory procedure.
2. Such legislation should be broadly conceived, in the nature of an enabling act providing for the adoption, administration, and improvement from time to time of an Aeronautical Code under proper Government authorization created by the Act.
3. Adequate facilities within the Department of Commerce for promoting the regulation and development of commercial air transport operations in interstate and foreign commerce.
4. Intra-state legislation and operations to conform as nearly as possible to the basic Federal legislation.
5. Encouragement of widespread public support of this essential aeronautical legislation.

Declaration

Aviation is a national American institution, in origin and principle, and should continue as such. In practical development commercial aeronautics is now suffering from the results of war-time specialization and over production. Through lack of legal and economic status it is not receiving the practical encouragement it deserves, not only as a most powerful arm of quick national defense, but also as a new transportation agency of great potentiality. Properly developed and articulated with present transportation systems this new agency can become a most valuable addition to the Nation's specialized carrier capacity in peace as well as in war. Recent hard experience in hurriedly training an adequate flying corps emphasizes the great need of a sufficient reserve available for any national emergency.

At present, nation-wide regulative legislation is greatly needed, not only for the ordinary needs of public safety, but also to establish the legal status and responsibilities of air transport in national and international business. Canada, Australia and European nations have already provided such legislation. Without practical encouragement, commercial aeronautics in America will continue to lag behind foreign development to such an extent as to constitute a menace to future security and to delay fatally that essential commercial development in which America should rightly stand first.

Statement of the Problem

Commercial air transport in the United States is in the doldrums and apparently will remain so until it is given legal and economic status by Federal, or at least by unified State action. There is little or no possibility of adequate and prompt development without coordination of the Federal Government and the several States and of the dozens of cities, in providing landing fields or air harbors with suitable repair and supply facilities, with adequate demarkation of cross-country air lanes between these fields and with radio signaling and control equipment between land and ship or plane, especially to permit night and storm flying. The main question is, therefore, what necessary steps should be taken to place American commercial aeronautics on the business footing comparable with other nations so that regular transport services for passenger, mail, express and perishables or valuables may be inaugurated in this country under private initiative and which will make possible the investment of needed private capital in this increasingly important arm of the Nation's transportation system?

Briefly, the answer may be summarized in the following essential steps:—

1. Adequate regulatory legislation.
2. Extensive cooperation of districts and localities in providing properly equipped air harbors and intermediary air lanes, under unified federal control.
3. Cooperation of the Government along certain lines of aerological and radio broad-casting service.
4. Temporary continuance of the valuable pioneer development work of the Air Mail until substantial realization of above essentials permits of private enterprise.
5. Extensive educational work to bring about a public understanding of the importance of this national problem.

The first essential is to get some federal legislation enacted so that commercial air transport can be seriously launched and developed.

Why is National Legislation Needed?

The aeronautical industry is the only important case on record of a new industry asking to be regulated from the inception of its operations. We have the Transportation Act, Public Utility Acts and Marine Act, all of which have been developed under public pressure for the regulation of these transport industries.

The aeronautical industry, however, invites it, realizing that the success of air transport is bound up with and vitally depends upon the promulgation of an efficient code of rules and regulations under which flying would be rendered easier and safer, responsibility between carriers and traffic would be definitely allocated, and the conditions under which business must be transacted would be known to all parties concerned. Such an aerial code is an absolute necessity for commercial aviation. The United States is the only large western nation participating in the European war which has not such a code. Canada has a complete code patterned after but modified from the much used International Code brought down from the League of Nations. At present United States fliers are only permitted in Canada through international courtesy. However, a United States code is nearing a practicable stage, and only awaits enabling legislation.

The National Bank of Commerce recently reported that a uniform law governing the use of airplanes is essential if commercial aviation is to be developed on a business basis, and that such a law must be at least national in scope and should be international. The statement urges every effort for regulative legislation—*"Until this is obtained, air transportation cannot be said to be on a business basis."*

The Department Committee does not undertake expressions for or against any of the numerous bills providing for air legislation which have been presented or are now before Congress. For the reason that great study and research has already been given to the development of a broad constructive measure, the Committee rests upon one important line of action, viz., the real necessity of promptly *making a start* in fundamental laws.

European Air Line Requirements

Combine of German, Dutch and Scandinavian Air Lines Issues Technical Requirements for Commercial Aircraft

For the purpose of insuring a uniform exploitation of international airways the International Air Traffic Association, Ltd. (I. A. T. A.) was formed in August, 1919, by a number of European air transport companies. The fundamental idea underlying this organization is that governing the big steamship combines, in that the members of the association agree to certain standard rates and technical requirements, but they retain their absolute independence in all other business matters.

The Membership

At present the membership of the I. A. T. A. is as follows:

Danske Luftfartselskab, Amaliegade 27b, Copenhagen, Denmark; Danziger Luftreederei, 9 Elisabethwall, Danzig, Free State of Danzig; Deutsche Luftreederei (D. L. R. Line), 4 Sommerstrasse, Berlin, Germany; Finska Lufttrafik A. B., 13 Skillnaden, Helsingfors, Finland; Koninklijke Luchtvaart Maatschappij (K. L. M. Line), 13 Heerengracht, The Hague, Holland; Svenska Lufttrafik A. B., 7 Kungsgaten, Stolkholm, Sweden.

At a meeting held in Stockholm last fall, the I. A. T. A. agreed on a number of technical requirements which are to be followed in the construction and operation of the transport airplanes of the associated companies. These requirements have now been published in pamphlet form under the title "Outlines for the Construction of Commercial Airplanes," and are abstracted below.

Classes of Commercial Aircraft

Commercial airplanes are divided into three classes as follows:

First Class.—Airplanes carrying a useful load of up to 200 kg. (440 lb.) beside fuel for 600 km. (370 miles), wanted for transporting one or two passengers, and small amounts of mails, and for courier service.

Second Class.—Airplanes having a useful load of from 600 kg. to 800 kg. (1320 lb. to 1760 lb.) and carrying fuel for 600 km. (370 miles), wanted for regular air mail services, the transport of from six to eight passengers (including a mechanic) with their baggage, or an equivalent load of freight.

Third Class.—Airplanes having a larger useful load and a larger radius of action.

Commercial seaplanes are divided into three classes of similar characteristics, except that first class seaplanes are to carry fuel for only 400 km. (250 miles).

Allowance is made for special classification of night flying airplanes, but as experience in this matter is still limited, they are not considered for the present. Likewise, for practical reasons, only first and second class airplanes and seaplanes are considered for the time being.

The tanks of all these aircraft should have sufficient capacity for a flight of 120 miles in excess of the figure given in each case.

The machines should embody a fair amount of inherent stability and answer the controls positively. It should be possible to fly them in calm weather for at least 2 min. without touching the controls. Cruising speed should be obtained with two-thirds the maximum horsepower available, so the reserve power may be used when most necessary, that is in climbing and in fighting head winds. Good flying properties should not require maximum power output.

The following performance requirements are specified for airplanes and seaplanes:

Cruising Speed.—Airplanes, first class, 100-110 m.p.h.; second class, 110 m.p.h. Seaplanes, first class, 93 m.p.h. second class, 100 m.p.h.

Climb with Full Load.—First class airplanes and seaplanes, 3300 ft. in 6 min., 6600 ft. in 12 min.; second class airplanes and seaplanes, 3300 ft. in 8 min., 6600 ft. in 15 min.

Take-off and Landing.—Airplanes of both classes should have a maximum take-off run of 660 ft., and a maximum landing run of 500 ft. Seaplanes should take-off in a smooth sea, with no wind, within 20 sec. for machines of the first class, and within 30 sec. for machines of the second class. Seaworthiness requirements include remaining safely afloat, for first class seaplanes, in waves up to 10 ft. with a maximum wind velocity of 30 ft. per sec., and for second class seaplanes in waves up to 13 ft. with a maximum wind velocity of 40 ft. per sec. Seaplanes should be capable of maneuvering afloat under the above stated sea and wind conditions.

Reliability

From the viewpoint of reliability the following requirements are considered essential: Clear view of the engine from the pilot seat. Provisions for quickly replacing the powerplant. Short and accessible airplane and engine control leads and pipes. Use of "armored" (metal tipped) or all-metal propellers. To circumscribe the fire hazard the timing of the inlet and exhaust valves of the engine should be positive and easily effected; the fuel tanks should be so mounted as to be removed as far as possible from the primary source of fire; and a fire wall should be provided between the engine compartment and the pilot cockpit or the passenger cabin. On seaplanes the hull or floats must be provided with water-tight compartments. The flotation must be 30 per cent in excess of twice the weight of the machine fully loaded. Landing gears must be equipped with high capacity springs insuring large and gradual shock absorbtion.

Accomodations

The control cockpit should afford a good view forward as well as on both sides downward. The pilot seat should be comfortable, and the foot-bar should be adaptable in length to the size of the pilot. Where the passenger capacity exceeds six, the machine should be provided with a dual control set, and access should be provided from the control cockpit to the passenger cabin. The control cockpit should be so constructed as to protect the pilot against injury in the case the machines noses over.

The pilot should have a clear view of the following instruments: altimeter, air speed indicator, revolution counter, gasoline gage, compass, and clock. A radiator thermometer, level indicators, and drift indicator are desirable adjuncts. The compass should be so placed as to be adjustable without requiring the pilot to turn his head.

The passenger cabin should be strongly built and the experience of modern automobile body building should be applied to it. Every seat should be at least 22 in. square, and the clear height above each seat should be at least 38 in. A clear space of 12 in. should be provided in front of the seat for knee space, and it should be possible on all seats to stretch one's legs. All doors should be so fitted that they may be opened from the inside. Provision should be made, through the muffling of the exhaust as well as by suitable sound-proof cabin construction, for the carrying on of conversation in the cabin without raising the voice, and a means of communication should be provided between passengers and pilot. The windows should be so fitted as to give the passengers, when seated, a good view of the ground. The larger windows should be susceptible of use as emergency exits. The main emergency trap doors should be so placed as to enable passengers to get out of the machine as quickly as possible, even if the machine is turned over on its back. Attention should be paid to ventilation and heating.

The passenger cabin should allow for sufficient stowage of hand baggage, and a small baggage room fitted with a lock should in addition be provided. This baggage room should allow for the stowage of two trunks, 30x18x9 in. on first class airplanes and seaplanes, and of six trunks of this size on second class airplanes and seaplanes. Airplanes and seaplanes of the second class should in addition be fitted with a mail compartment 18 in. square, which it should also be possible to lock.

Radio and Fuel Capacity

Airplanes and seaplanes of the second class should be provided with a radio sending and receiving apparatus. The antenna should be so mounted as not to hang below the fuselage and so risk fouling the propeller or tail planes. The sending and receiving set of the radio should be fitted in a separate cabin. If the signals are received by sounder system, it should be possible to hear them even if the engine is running "all out".

In addition to the fuel load required for the radius of action above specified for the various classes of aircraft, the fuel tanks should have an additional capacity permitting a flight of 200 km. (120 miles) in excess of the figures given.

Transport by Rail

With the wings dismantled, the airplane or seaplane should be transportable on normal railroad cars without requiring further dismantling. Seaplanes should be provided with hoisting shackles. This provision also is desirable on airplanes.

Classification of Qualities

Assuming equal qualities of airworthiness, and in the case of seaplanes, also of seaworthiness, the difference in merit between various aircraft of a class may be indicated by the following classification:

Principal Technical Conditions.—(1) Speed range. (2) Lowest landing speed. (3) Highest cruising speed. (4) Fast take-off, seaworthiness, steering when afloat. (5) View from the control cockpit.

Principal Economic Conditions.—(1) Lowest fuel consumption. (2) Price of purchase. (3) Durability and ease of repairs. (4) Lowest maintenance cost.

Other Technical and Economic Conditions.—(1) Excess motive power; (2) Improved power plant; (3) Airworthiness with reduced horsepower and varying loads; (4) Adaptability of power plant to the use of different fuels and at different temperatures; (5) Constructional features concerning the safety of passengers, freight, and crew, such as dual control, improved construction of cabin, effective emergency exits, etc.; (6) Flying qualities with changeable fuel load and freight; and ease in stowing freight; (7) Passenger comfort and improvements in freight loading; (8) Possibility of conversion of land undercarriage to sea undercarriage, and features of rapid dismantling; (9) Convertibility of cabin from passenger to freight use, for summer and winter service, etc.

The Air Mail before the Senate

Postmaster General Will H. Hays appeared before the Senate Appropriations Committee on Feb. 23 to make an earnest appeal for the restoration by the Senate Appropriations Committee of the appropriation eliminated by the House General Appropriations Committee for air mail.

In presenting the matter, the Postmaster General said: "It is not so much the length of the step as the direction of the step that is important in anything, and it is a step in the wrong direction, in my opinion, to abandon all Air Mail Service. Much progress has been made in the development of the air mail against heavy odds prior to this last year, and still further sound and safe progress is being made.

"The future of the country is in the air. The Air Mail Service is of great value, per se, and is, in addition, of tremendous potential value as a defense reserve in case of necessity. Commercial air activities may be ultimately developed in a way to provide this service. This will not come in the next fiscal year, and by all means a reasonable effort, consistent with proper expense and certain safety, should develop the Air Mail."

The Air Mail Service appropriation asked for the fiscal year 1923 was $2,200,000, while the amount reported by the House Committee was $1,935,000. The Air Mail item was totally eliminated from the Post Office Appropriation Bill by the General Appropriation Committee, Congressman Madden, Chairman.

The amount of money expended for Air Mail Service last fiscal year was $2,600,000. Of this amount $1,245,000 was expended from the Railroad Transportation Appropriation. The Air Mail Service Appropriation for last year was $1,375,000.

The appropriation for the current fiscal year is $1,425,000. No other appropriations are used, and it is possible that the service may have to be curtailed to some extent before June 30, although an effort is being made to fly six times a week without a deficit. Since July 1, the personnel has been reduced from 521 to 448, a reduction of 73 employees whose annual salaries amounted to $127,075. It is proposed to make further reductions in the personnel.

The Air Mail Service now has fifty-three ships in flying condition and twenty undergoing repairs. Major repair work at a number of the fields has been ordered discontinued in the interest of economy. At the close of the present fiscal year, it is estimated that not more than twenty-five ships will be in flying condition and the stock of supplies will be reduced to a minimum.

The appropriation for the fiscal year 1923 must be greater than that for the current fiscal year to insure satisfactory service, for the following reasons. On July 1, the Air Mail Service will be practically out of supplies and material; it will be necessary to immediately employ a large force of mechanics to bring the ship situation up to normal condition, which is fifty ships. The equipment received from the Army at the present time is not in good condition. All wings need repairs; damaged longerons must be replaced in many ships received; the Army stock of propellers suitable for our use is exhausted and the same is true as to landing gears, gasoline tanks, tail skids, radiators, shutters, and many other accessories.

Following is the performance of the Air Mail Service, July 1, 1921, to Jan. 31, 1922:

Miles traveled	1,029,056
Number of letters carried	25,496,560
Percentage of performance:	
Trips completed	93.12 per cent
On a mileage basis	94.27 per cent
Number of ships daily in the air	21
Miles flown daily with mail	5,360
Estimated mileage for year	1,800,000
Number of fields (all fully equipped)	15
Number of radio stations (all except Rawlins, Wyoming)	14
Estimated value of equipment on hand	$1,500,000

No fatal accidents have occurred in the current fiscal year mail flights. More than one million miles have been flown since last fatal accident, which occurred on July 16 on a ferry trip.

Colonel Shaughnessy introduced a safety-first campaign and insisted that safety must be given consideration over percentage of performance. His policy has been carried out with very good results as shown above.

It is believed that if the Senate restores the Air Mail item, the full amount, namely $1,935,000, should be restored. The estimates for the year 1923 were very carefully prepared and it is the Department's opinion that it will require practically $2,000,000 to fly the transcontinental route safely. It would be better to discontinue the service if it cannot be flown with ships in good condition.

"Who's Who in American Aeronautics"

(Copyright, 1921, by The Gardner, Moffat Co., Inc.)

The biographical sketches of men who are prominent in American Aeronautics are printed periodically in AVIATION. The first series will be shortly published in a more durable form, and revised issues will be published semi-annually to take care of the frequent changes in station of Army and Navy officers, and such other changes as may occur. As errors and omissions are liable to occur in a compilation of this character, interested parties are requested to notify "Who's Who" Editor of the necessary corrections so the record may be kept up to date.

Michael Gregor

GREGOR, MICHAEL, Aeronautical Engineer; born, Derbent, Russia, Feb. 6, 1888; son of Levan Gregor and Sophie Gregor.

Educated: Public Schools, Petrograd, Russia; Institute of Engineers of Ways of Communications, Russia, Engineer 1912.

Professional: Engineer of Ways of Communication, Russian Government, 1912-1914; Engineer of Buildings, Tiflis, Ga., 1918-1920.

Aeronautical Activities: Airplane constructor, Stetinin & Co., Petrograd, 1910; chief test pilot, Pischof & Co., Paris, 1911; manager technical section, Stetinin & Co., 1914-1915; Consulting Engineer, airplane propeller construction, Petrograd, 1915-1918.

Flying Rating: Pilote-Aviateur Brevet, France, No. 577.

War Service: Pilote-Officier, Russian Army, 1916-1918.

Member: Aero Club of Russia, Society of Engineers of Ways of Communication of Russia.

Present Occupation: Aeronautical Engineer, Gallaudet Aircraft Corp.

Address: East Greenwich, R. I., c/o Gallaudet Aircraft Corp.

William Russell Bradford

BRADFORD, WILLIAM RUSSELL, Commercial Aviation; born, Bonham, Tex., April 18, 1895; son of Claude Lane Bradford and Annie (Russell) Bradford.

Educated: Public schools of Bonham, Tex.; three years, University of Wisconsin.

Professional: Student until beginning of the War; automobile business 1919, partner in Bradford Automobile Co.; resigned and entered Cantilever Aero Co.

Aeronautical Activities: Ground School, Austin, Tex., 1917; cadet, Gerstner Field, 1918; appointed instructor in formation flying; transferred to Rockwell Field, Aug. 1918 for gunnery course and was later appointed instructor and test pilot.

Flying Rating: Reserve Military Aviator, May 1918.

War Service: Army Air Service, Aug. 1917 to Jan. 1919.

Member: Aero Club of America.

Present Occupation: Assistant Treasurer, Cantilever Aero Co.

Address: 1269 Broadway, New York City; home, 405 Park Ave., Bonham, Tex.

C. Eugene Johnson

JOHNSON, C. EUGENE, Air mail pilot; born, Chicago, Ill., May 11, 1895; son of O. J. Johnson and A. J. Johnson.

Educated: Public Schools, Chicago, Ill.; Chicago College.

Professional: Traveling salesman, Brass Products, prior to war.

Aeronautical Activities: Primary training, Park Field; Instructor, Park Field; Gosport Training, Brooks Field; Instructor, Brooks Field; Instructor, Chief Instructor, Ass't O.I.C. Flying, O.I.C. Flying, Eberts Field; Arkansas Aviation Co., carried 3200 passengers, 1919-1920; Flying Supt. and Director Memphis Aerial Co., 1920; Air mail pilot 1921 to date.

Flying Rating: Reserve Military Aviator.

War Service: May 1917 to Aug. 1919.

Present Occupation: Air Mail Pilot.

Address: Reno, Nev.; home, 4418 N. Albany Ave., Chicago, Ill.

W. Earnest Hunter

HUNTER, W. EARNEST, Commercial Aviation; born Oakland, Iowa Aug. 18, 1893; son of H. M. Hunter and Clara (McFadden) Hunter.

Educated: High School, Woodbine, Iowa; B.A., University of Iowa, 1917.

Professional: Taught in High School, Fall of 1917 and again in Fall of 1919.

Aeronautical Activities: U.S.S.M.A., Berkeley, Calif., Mar. 30, 1918 to Jan. 6, 1919; Rockwell Field and Mather Field, Mar. 19, 1920 to Oct. 1, 1920; Manager and Pilot for Bennett Aviation Co., Trinidad, Col.

Flying Rating: Reserve Military Aviator.

War Service: Nov. 15, 1917 to Nov. 11, 1918.

Address: 215 Masonic Temple, Denver, Col.; home, Woodbine, Iowa.

William Freeland Fullam

FULLAM, WILLIAM FREELAND, Rear Admiral, Retired; born, Pittsford, N. Y., Oct. 20, 1855; son of Nathan Seymour Fullam and Rhoda A. (Stowits) Fullam; married, Mariana W. Robinson, April 15, 1885.

Educated: Rochester High School; De Graffs Military School; U. S. Naval Academy, 1873.

Professional: Mediteranean Cruise, U.S.S. Marion and U.S.S. Trenton, 1877-1879; Final Graduation, Naval Academy, 1879; China Cruise, U.S.S. Swatara, 1879-1882; Dept. Applied Mathematics and Mechanics, and in charge battalion of Midshipmen, Naval Academy, 1883-1887; cruise in U.S.S. Boston, Yorktown, Vesuvius and Trenton, 1887-1891; Dept. Applied Mathematics and Mechanics, and in charge battalion of Midshipmen, 1891-1894; on board U.S.S. Raliegh and Miantonomoh and in Dept. Ordnance, Naval Academy, 1894-1897; U.S.S. New Orleans, 1898; Exec. Off. U.S.S. Lancaster, 1899-1901; Head Dept. Ordnance, 1902-1905; commanded U.S.S. Marietta, 1906-1907; Commandant Naval Training Station, Newport, R. I., 1907-1909; commanded U.S. Battleship Mississippi, 1909-1911; Commandant, Naval Training Station, Great Lakes, Ill., 1911-1912; Aide to Sec. of Navy, 1913; Superintendant, Naval Academy, 1914-1915; Commander-in-chief, Pacific Reserve Fleet, Oct. 1915; Commander, Reserve Force, Pacific Fleet, 1916.

Aeronautical Activities: Has written many articles emphasizing the use of aircraft in a "Three-Plane Navy".

War Service: Commander, Patrol Force, Pacific Fleet and later as Commander, Division 2, Pacific Fleet; upon the departure of Commander-in-chief, remained as senior officer present in the Pacific, cooperating with the British and Japanese forces; in charge of all Naval Districts in the Pacific, in order to secure better coordination with the Army in all defensive measures.

Books: Hand Book of Infantry and Artillery, Petty Officer's Drill Book, Recruits' Handy Book, Text Book of Ordnance and Gunnery for Naval Academy (Fullam & Hart), Navy Drill Books (Senior Officer of Board), numerous articles on Air Power.

Member: New York Yacht Club, Naval Academy Club, Army and Navy Club.

Present Occupation: Rear Admiral, retired.

Address: Army and Navy Club, Washington, D. C.

Edison Esadore Monton

MONTON, EDISON ESADORE, Air Mail Pilot; born, Sacramento, Calif., Dec. 10, 1894; son of Edward E. Monton and Gertrude Frances (Winters) Monton; married, Claire Yerington, April 24, 1921.

Educated: Sacramento High School; Ft. Bron Aeronautical School, France.

Professional: Hop growing and ranching, Sacramento, Calif., 1915-1917.

Aeronautical Activities: Graduated Ft. Bron Technical School, Nov. 1917; attached test dept. Issoudun, France, as mechanic in charge of test line, Field 5, Dec. 1917 to May 1918; graduated, Issoudun Pursuit School and commissioned, Sept. 1918; test pilot, Issoudun, Sept. 1918 to April 1919.

Flying Rating: Reserve Military Aviator.

War Service: U. S. Army, May 1917 to May 1919; A. E. F. Aug. 1917 to May 1919.

Member: Allied Fliers Club of Oakland; Air Mail Pilots of America; Veterans of Foreign Wars; Native Sons of the Golden West.

Present Occupation: Air Mail Pilot.

Address: Air Mail Field; home, Reno, Nev.

Brauner Jens Ostergaard

OSTERGAARD, BRAUNER JENS, Airplane Manufacturer; born, Aarhuus, Denmark, Oct. 22, 1887; son of Christ J. Ostergaard and Ellen (Rasmussen) Ostergaard; married, Velva Myrtle Sherman, Feb. 21, 1915.

Educated: Grammar and High School.

Aeronautical Activities: Aeronautical construction from 1910 to date.

Present Occupation: The Ostergaard Aircraft Works.

Address: 4269 N. Naragansett Ave.; home, 4271 Naragansett Ave., Chicago, Ill.

William Albert Hyde

HYDE, WILLIAM ALBERT, Consulting Engineer; born, Wilmar Minn., Aug. 10, 1874; son of Albert A. Hyde and Ella R. (Hall) Hyde.

Educated: Hillhouse High School, New Haven, Conn.; Sheffield Scientific, Yale, Ph.B. 1901; Special, M.I.T., 1903-04; George Washington University, 1905-07; Harvard 1913-15.

Professional: Assistant in Physics Laboratory, Sheffield Scientific, Yale, 1902-1903; Assistant in Electrical Engineering Laboratory, M.I.T., 1903-1904; Electrical Assistant at large, Signal Corps, Washington, D. C., 1905; Electrical Expert, Bureau of Ordnance, U.S.N., Washington, D. C., 1905-1914; President, Anchor Scale Co., Cambridge, Mass., 1914-1917.

Aeronautical Activities: Assigned in charge of photographic work at Mineola, March 15, 1918; Transferred to Science and Research Div., Signal Corps, May 15, 1918; Duty at Washington and Langley Field on Bombsights, Stabilization and Bomb Trajectories; O.I.C. Science and Research Laboratory, Langley Field, special work testing bomb sights and developing stabilized camera.

War Service: Priv. 1st Cl. Nov. 14, 1917; 2nd Lieut. A.S.S.C., Feb. 26, 1918; 1 st Lieut. A.S.A.P., Oct. 27, 1915; Capt. AS-ORC, March 22, 1920.

Books: Navy Ordnance Pamphlets; No. 399 Flight of Projectiles, No. 422 Air Phenomena about Bullets in Flight.

Present Occupation: Consulting Engineer.

Address: 42 Church Street; home, North Haven, Conn.

William M. Fellers

FELLERS, WILLIAM M., Aeronautical Engineer; born, Macon, Ga., May 26, 1889; son of Wm. F. C. Fellers and Lily (McCarrel) Fellers.

Educated: Dural County, Fla. public schools; B.S. in M.E. 1910, and M.E. 1920, Georgia School of Technology.

Professional: General engineering, 1910-1915.

Aeronautical Activities: Aeronautical Draftsman; Chief Aeronautical Draftsman, Naval Air Station, Pensacola, Fla., 1915-1918.

Flying Rating: Naval Aviator, March 1919.

War Service: Lt. (j.g.) U.S.N.R.F.-5, in charge Experimental Department, Hampton Roads, Va.

War Honors: Citation and Navy Cross.

Member: Associate member, American Society of Mechanical Engineers.

Present Occupation: Assistant to Chief Engineer, N.A.F., in charge Catapult Design.

Address: Naval Aircraft Factory, Philadelphia, Pa.

Andrew Calhoun McFall

McFALL, ANDREW CALHOUN, Lieutenant U. S. Naval Aviation; born, Darlington, S. C., Feb. 6, 1893; son of Lillie Duncan McFall.

Educated: Ridgeway High School; Donaldson Military Academy; U. S. Naval Academy.

Aeronautical Activities: Completed courses at Pensacola, Fla., Nov. 9, 1920, Carlstrom Field, Jan. 15, 1921, Kelly Field, April 1, 1921; Atlantic Fleet Shipplane Div., April 10, 1921, Test Pilot, Naval Aircraft Factory, May 20, 1921 to date.

Flying Rating: Naval Aviator.

Present Occupation: Test Pilot, Naval Aircraft Factory.

Address: Naval Aircraft Factory, Philadelphia, Pa.

William Alexander Laird

LAIRD, WILLIAM ALEXANDER, Airplane Manufacturer; born, Chicago, Ill., March 18, 1891; son of Matthew A. Laird and Clara Louise Laird; married, Rose L. Pfan, Dec. 25, 1911.

Professional: Woodworker and cabinet maker, 1910-1913; building, overhaul and repair of internal combustion engines, 1913-1918.

Aeronautical Activities: Helped build first Laird Scout, Model S, with E. M. Laird Co., 1919; designing experimental aircraft for Ostergaard Aircraft Works, 1919 to date.

Present Occupation: Airplane construction.

Address: Ostergaard Aircraft Works, 4269 Narragansett Ave.; home, 6706 S. Peoria Street, Chicago, Ill.

Battle Cruisers as Aircraft Carriers

Assistant Secretary Roosevelt of the Navy recommended to the House Naval Affairs Committee on Feb. 20 the conversion of two of the battle cruisers originally destined for the scrap heap, into airplane carriers, and asked that work be begun at once. He said the reconstruction could be effected for about $13,000,000 each in addition to the $10,000,000 already expended on the two vessels nearest completion, making the total cost of each of the 33,000 ton ships about $23,000,000 each.

The United States representatives at the Limitation Conference originally proposed a limit in airplane carrier tonnage of 80,000 tons apiece for themselves and Great Britain, with a proportionate amount for the other nations concerned. At the insistence of the other nations, this tonnage allowance was raised to 135,000 tons for the United States and Great Britain, 81,000 tons for Japan, and 60,000 tons for France and Italy respectively. The limit in size for airplane carriers was set at 27,000 tons. They were restricted also in armament, both as to size and caliber of guns carried. The United States representatives, in order to save money for this country, also suggested and obtained the consent of the other powers to the conversion of two of the ships in process of construction which would otherwise be scrapped into airplane carriers whose tonnage should not exceed 33,000 (thirty-three thousand) tons. The same privilege was extended to the other powers concerned. In requesting this permission the United States representatives had specifically in mind that, on certain of the battle cruisers now under construction, approximately $10,000,000 had been expended or obligated per ship. The technical bureaus, after investigating this subject figure that it will take about $13,000,000 per ship, in addition, to complete these. In other words, the cost of completing these airplane carriers, for hull and machinery will be about $23,000,000. To build a new 27,000 ton airplane carrier would cost $22,000,000, for hull and machinery. Therefore, by this provision, the United States saves, on these two ships, between eighteen and twenty million dollars.

At this moment the British navy has seven airplane carriers of various sizes and speeds. The United States has one carrier (The Langley) that is in process of conversion. The Japanese have one specifically designed building.

The employment of the airplane has been one of the important departures in modern naval development. Airplane carriers are essential if airplanes are to be employed with the fleet. The Department recommends most strongly the conversion of two of these ships under construction, as, in this manner, we will be furnished with units that are vitally necessary more cheaply than could otherwise be the case.

Triplane Assigned to 90th Squadron

The GAX twin liberty armored triplane, which some pilots interpret as guns, armor and X the same as in algebra, has been assigned to the 90th Squadron (Attack) and is being flown by pilots of the 3rd Group (Attack). The performance of this attack plane during airdrome hops has been satisfactory. The speed of approximately 106 m.p.h. has been attained and the maneuverability is all that could be expected for a plane of such great weight. The limited gasoline supply (2 hr.) together with the extensive ground required for landing and taking off, especially in high altitudes, is a serious factor to be considered in connection with the successful operation of this plane from border stations.

Spad Outstrips the SE5

The First Pursuit Group at Ellington Field reports that two reconstructed Spads have been completed and tested satisfactorily, with a speed considerably in excess of the SE5. The reconstruction of a sufficient number of these Spads will allow the Pursuit Group to carry on training successfully pending the release of the MB3's. The reconstructed Spad referred to is the Spad XIII, in which the 220 Geared Hispano Suiza Engine has been replaced by the 180 hp. Wright.

The Ambulance Airplane

It appears that the ambulance airplanes of the Levant and in Morocco are growing rapidly in their emulation of each other, which is both admirable and profitable. Every day a new record is made by one or the other.

A few weeks ago in Morocco they made a remarkable record by transporting 18 wounded men 80 km.; now we hear in the Levant they have just evacuated 44 wounded a distance of 400 km. over the desert of Syria between Deir-ez-Zor, on the Euphrates at the southern border of the English Mandate and Aleppo. This last operation is a record for transporting wounded by airplane. Moreover, the conditions under which it was done and the advantages gained merit attention.

After the victorious battles of Oct. 24 and 26, fought in the region of Deir-ez-Zor by Colonel Debieuvre against the warlike tribe of Ogueidats, who fought all the more fiercely against our troops because they had given a severe setback to the British in 1920, General Gouraud, High Commissioner in Syria, gave orders on Oct. 26 to Medical Inspector Emily, Chief Surgeon of the Army of the Levant, and to Major Denain, commanding the Air Service, to prepare for the evacuation as rapidly as possible to Aleppo of the wounded we had during the course of these glorious combats. This work was rendered particularly difficult and dangerous due to the fact that the 400 km. which separate these two places is an inhospitable desert, without landing places, occupied by hostile Bedouin tribes, with atmospheric conditions characteristically severe in these regions, and particularly because it was impossible to have a gas station at Deir-ez-Zor, which is 20 days from Aleppo by camel convoy.

A detachment, composed of all the ambulance airplanes in service with the Army of the Levant, was immediately organized at Aleppo under the command of Lieutenant Pilot Vindreau and of the Chief Surgeon of the Air Service in the Levant, Dr. Liegeois. On Oct. 25 a military surgeon, Dr. Chevallier, went to Deir by airplane to render the urgent surgical assistance needed. The same day five airplanes brought back 10 wounded, covering in a few hours the 800 km. for the round trip from Aleppo to Deir-ez-Zor and return, a very remarkable performance when the difficulties enumerated above are considered.

Evacuation continued the following days, and soon all the transportable wounded—44 in all—were transported by air to the military hospital in Aleppo, making in three hours and and a half and under very satisfactory conditions, as far as comfort is concerned, a trip which requires at least a week by motor ambulance, and by camel or cacolet (form of saddle for horse or mule, carrying two men in a sitting position) more than three weeks over heavy roads. This would have been very trying on the wounded men.

Thanks to the airplane, Principal Surgeon Chartres, Division Surgeon of the 2nd Division, was able to go to Deir to superintend the evacuation and care of the wounded. Dr. Liegeois, who followed and directed the operations from the medical standpoint, estimates that, without counting the suffering that was avoided, five wounded men owe their lives to this method of evacuation.

The results are a great honor to the Air Service of the Army of the Levant and especially to the pilots who, not satisfied with being courageous war pilots, have on this occasion given proof of their skill, endurance and training by bringing safely into port all the wounded confided to them, in spite of the difficulties of such a long flight.

It should be noted that in all the time that this means has been used for evacuation in the Levant, not a single wounded or sick man has been the victim of an airplane accident.

—Translated from FIGARO

Progress in Training Student Officers

New classes in advance training for student officers and cadets are under way at Ellington and Kelly Fields, there being ten pursuit and seven bombardment students enrolled. Airplane pilot rating has been received by all members of previous classes and many new wings adorn the breasts of recent graduates in recognition of proven ability.

Certificates of Airworthiness

Underwriters' Laboratories

At a recent meeting of the Executive Committee of the National Aircraft Undewriters' Association it was determined that the present plan for registration of aircraft pilots and for registration of aircraft by Underwriters' Laboratories be extended to include a plan for "certificates of airworthiness" for individual aircraft. Major Schroeder is now active in the preparation of such a plan, which includes a list of technical representatives in various parts of the country who will be competent to make the inspections necessary or preliminary to the issuance of an airworthiness certificate. It is the plan of the members of the National Aircraft Undewriters' Association to insist upon certificates of airworthiness as a condition of future policies on aircraft.

This certificate of airworthiness feature in the plan of Underwriters' Laboratories' contact with aircraft matters is particularly essential and necessary at this time since it has been wrongly assumed that the registration of aircraft includes assurance of safety or airworthiness. This is not the case, as will be evidenced from a brief study of the International Aircraft Convention report. A certificate of registration is issued merely for identification purposes of individual aircraft, and offers no assurance whatever that the ship is safe to fly, or is capable of undertaking the particular work under consideration. Hence the airworthiness certificate program is essential to avoid misunderstandings covering the real significance of the Aircraft Register. In this connection all aircraft registration certificates, going out after the first six, which have already been issued, will be rubber stamped diagonally across their face with outlined letters reading, "Airworthiness Certificate, none."

Changes in Air Mail Service Personnel

The following changes in personnel have taken place at the Air Mail Office at Crissy Field: G. H. Colwell has resigned as Superintendent of the Western Division of the Air Mail and has been succeeded by C. A. Nelson, who has for some time past been Field Manager at the Salt Lake Field, as well as Assistant Superintendent of the Western Division. With this change Mr. Nelson has decided to move the headquarters from Crissy Field to the Salt Lake Field. The new assistant Superintendent, W. E. LaFollette, will be stationed at Crissy Field.

Newton B. Converse, a former aviation mechanic at Mather Field, has also resigned his position with the Air Mail Service, and will be succeeded by Porter D. Bush, a former Air Mail Service employe at the Chicago Field.

Do not Stunt DH4B's

The office of the Chief of Air Service notifies the following:

1. The attention of all concerned is invited to the fact that the DH4B airplane is not designed to stand the strains involved in the performance of loops, Immelman turns, spins or rolls. The DH4B should not be "rolled" under any circumstances, nor should a dive at a speed in excess of 150 m.p.h. be made.

2. Strengthening or making changes in DH4B airplanes with a view of their use in aerobatic flying will be done only on the approval of the Chief of Air Service and in accordance with instructions prepared by the Engineering Division, McCook Field.

New Air Mail Hangar at Crissy Field

The Aerial Mail Service have moved into their new hangar at Crissy Field, Presidio of San Francisco, Calif., and appear to be very much at home in their new surroundings. Work on the new office building is progressing, and it should be completed in a couple of weeks. The buildings vacated by the Aerial Mail Service have been turned over to the 316th Reserve Squadron (Observation), and they are now busily engaged in making the changes which they desire.

137th Observation Squadron

The State of Indiana has leased a new armory in Kokomo, to be used jointly by the 137th Observation Squadron (Air Service) and Battery A of the 181st Field Artillery, Indiana National Guard.

The building is being erected and financed by D. C. Spraker, a local citizen, on a tract of ground owned by him. The plans and specifications were approved by the Adjutant General of Indiana, and the building when completed, which must be within 120 days, will be leased by the State for a period of ten years. It is to contain offices and orderly rooms for each organization, a large drill floor, locker rooms, showers, kitchen and dance hall and a garage for the storage of all the Battery's material and parts of the Observation squadron's road equipment. All of the squadron's flying equipment is kept at the field 2 miles south of the city. The road equipment is kept in town to afford transportation for the men to and from the field.

The construction of the Armory and the two new hangars at the field has awakened much interest in the unit, and many new names have been added to the roster. Much credit is due the Kokomo Chamber of Commerce and the citizens through whose cooperation it has been possible to maintain two National Guard units in a city of this size.

Kokomo is a city of 35,000 population, 50 miles north of Indianapolis. The flying field is well marked, easily approached, convenient to town, and a welcome is extended to all visiting pilots. Gas, oil and service is available at all times.

Municipal Airdrome at Spokane

Opening of a new municipal aviation field at Spokane, Wash., under the direction of the Foster-Russell Aviation Co. has been authorized by the park board of that city. The new field will be situated toward the east end of Upriver park, at a point removed from the aviation field occupied for the last two years by the United States Aircraft Co., headed by C. H. Messer.

Under the proposal of the Foster-Russell company the firm will install markers, make needed preliminary improvements and transfer the great part of its flying operations to the field this year. For the second year the company will pay $100, for the third year $200 and increase the payment $100 each year so long as the arrangement continues. These fees together with all fees paid by private airplane owners for the use of the grounds, are to be spent in improvements. All fees to be paid are to be determined by the park board.

Mr. Russell stated that the aviation field now in use at Upriver park is a poor one-way or third-class field, while on the site proposed to be developed a four-way or first-class field can be laid out.

Coming Aeronautical Events

AMERICAN

Apr. 30 — *Spring Show and Opening Meet, Curtiss Field, Mineola, L. I.*

May — *National Balloon Race.*

Sept. 4 *(about)* — *Detroit Aerial Water Derby, Detroit. (Curtiss Marine Flying Trophy Competition.)*

Sept. 15 *(about)* — *Detroit Aerial Derby, Detroit. (Pulitzer Trophy Race.)*

Sept. 30 — *First Annual Interservice Championship Meet. (In preparation.)*

FOREIGN

Aug. 1 *(about)* — *Coupe Jacques Schneider. (Seaplane speed race.) Italy, probably Naples.*

Aug. 6 — *Gordon Bennett Balloon Race, Geneva, Switzerland.*

Oct. 1 — *Coupe Henri Deutsch de la Meurthe. (Airplane speed race.) France.*

American elimination trials, if required, to be held about Aug. 15, at Mitchel Field, L. I.

Foreign News

Argentina

A call for bids has been received from the Argentine Director General of Navigation and Ports for 4 seaplanes, with two extra motors, spare parts, etc., to be used on the Bermejo River. The seaplanes must have a carrying capacity of 8 persons, seated, including the pilot, in addition to a mechanic. Delivery must be made in Buenos Aires within five months after award has been made.

Brazil

According to a correspondent of the *London Times*, the President of Brazil has given his assent to an Act authorizing the expenditure of over £235,000 for the establishment of two aerial routes betwen the capital and Porto Alegre (in Rio Grande Do Sul). The one route, which is for seaplanes, will follow the coast while the other will be inland, following the railways where possible. The routes are to be inaugurated before the opening of the Centennial Exhibition next September. Their primary object is military defense, but the routes may be used for commerce, with the Government's consent. Wireless telephone and telegraph stations with a range of 300 miles are to be established at convenient points at a minimum distance of 190 miles apart, and at the terminal points there will be powerful plants capable of direct intercommunication. Modern meteorological stations are also included in the scheme.

England

The report of the Director of Medical Services, Col. M. H. G. Fell, Royal Air Force, for 1920 gives the number of flying accidents during the year as 71, of which number 39 occurred in the United Kingdom and 32 overseas, resulting in 14 deaths at home and 15 overseas. There was only one accident among the cadets, which was not of a serious nature, and a single death occurred among the N.C.O. observers.

France

Two French airmen, MM. Deulin and de Marmier, have mapped out the Paris-Constantinople air route by their initial flight out and back in 35 hr. of actual flying. After leaving Paris they made long halts at Strasbourg, Prague, Budapest, Belgrade and Bukarest. The distance of 1,770 miles from Paris to Constantinople was covered in 17 hr. of effective flight. The return journey from Constantinople to Paris was **made in 18 hr. of actual flight.**

Siam

During his "round-the-world" journeying, Lord Northcliffe made a stay at Bangkok, and on Dec. 23 he visited the airdrome at Don Muaung, where Sir Ross Smith alighted during his Australian flight in 1919. The London *Times* correspondent states that Lord Northcliffe was surprised to find the air station equal to most of those in Europe. Siam, he states, has 25 landing places and five airdromes. At Don Muaung there are 115 planes, including school machines and a staff of 650 men.

Switzerland

The Swiss Government has decided to increase the financial help that it is giving to civil aviation, and is prepared to assist in the establishment next year of a Swiss air mail to connect with international services. In the budget for 1922 the program for subsidizing civil aviation contemplates the increase of the military grant for each service pilot from 200 francs to 400 francs, also provision for grants in aid to enable civil aviation concerns to buy modern transport machines.

Syria

A new air service has been instituted in Syria between Latakia and Homs. Two journeys each way are, according to the Paris *Temps*, made per week, as on the similar services between Aleppo and Deir-Zor, Aleppo and Aintab, and Aleppo and Alexandretta. Services are also to be opened between Damascus and Palmyra and Damascus and Soweida (Hauran). A number of packages were carried on the Levant services, and in November, 31 wounded or sick were evacuated by airplane without accident.

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